

10 September 1964

DESIGN OBJECTIVES

TWIN LIGHT SOURCE STEREOSCOPE LIGHT TABLE

GENERAL:

1. Light tables which are currently used and which have a support for a stereoscope: (1) do not have a sufficiently large illuminated viewing area, and (2) cannot be tilted to positions convenient for the user.

2. The proposed light table (see sketch attached as Enclosure 1) must be capable of tilting through a range of angles. It must also have an adequate viewing area divided, by a removable partition, into two independent light sources for stereo viewing of positives with differing densities or with differing scales.

3. To be used under normal office working conditions, the table will not ordinarily be subjected to extremes in temperature or to excessive shock or vibrations.

4. For normal use, the table will not have reel brackets; but, if it appears practicable, the design should provide for dual reel brackets which could be mounted at a later date. The reference is to a type of dual reel bracket (T-2-5) manufactured by the Richards Corporation, Arlington, Virginia; or an equivalent. If it is practical to use these specific brackets, they will be supplied as government-furnished equipment.

5. Proposal must include the following:

- a. Cost and delivery time for one prototype.
- b. Cost and delivery time for three production models after the prototype has been approved.
- c. Cost and delivery time for one set of directly reproducible manufacturing drawings and specifications.

6. If the contract will cover a period of more than 90 days, we require monthly progress reports, which must also state the percentage of funds expended to that date and the percentage of work completed.

7. All proposals must be accompanied by a summary, (using the format shown in Enclosure 2) of the proposed table's characteristics.

ELECTRICAL:

1. Power Source:

a. The light table shall operate on a nominal 117-volt, 50-60 cycle alternating current supply.

b. The light table shall be equipped with a 3-wire power cord, not less than six feet long, terminated at one end with a "Deflex" Safety Power Connector (made by the APM-Hexseal Corporation, 41 Honeck Street, Englewood, New Jersey), or its equivalent. The other end shall be terminated within the light table and shall be securely mounted to the frame of the light table. The third (ground) conductor in the power cord shall be grounded to the metal frame of the light table.

c. Separate on-off switches shall operate each light source, and it is permissible to incorporate the switches into the intensity controls. Separate pilot lights should be built-in to indicate when the equipment has been turned on.

2. Light Sources:

a. The two light sources shall be high-intensity, light grids. The grids shall be designed so that they are interchangeable and can be replaced by relatively unskilled personnel using a minimum of the more common hand tools. The grids must not be potted or encapsulated.

b. The maximum intensity of each light source must not be less than 1500 foot-lamberts measured at the working surface. The light sources will be sufficiently diffused: having no more than 10% variation in intensity as the working surface is scanned along a line which is perpendicular to the light grids. The intensity of the two light sources shall be independently variable from full intensity to less than one-tenth of the full intensity and without noticeable flicker at any level of intensity. Variation in intensity shall be effected with two independent controls mounted at the rear of the light table but within comfortable reach of the operator from the front.

c. After extended use (6-8 hours), the temperature of the light table must not rise to the level where it becomes uncomfortable to use. Any air vents must be baffled to prevent light from shining into the operator's eyes or the eyes of anyone in proximity.

MECHANICAL:

1. General:

a. The overall dimensions of the light table shall be kept to a minimum to avoid wasting work space, but shall be consistent with good design principles. The height of the light table will be governed by the eye level of an average person in a sitting position when a B&L Model II Zoom 70 Stereoscope is used on the light table, which itself is placed on a working surface approximately 30 inches above the floor. The light table must have sufficient rigidity to resist warping when, with a stereoscope or microscope mounted on it, it is hand-carried from one desk to another.

2. Viewing Stage:

a. The lighted area shall be approximately 10 inches in width by 6 inches in depth. The total viewing area will be divided into two independently illuminated areas -- each approximately 5 inches wide by 6 inches deep.

b. The illumination for the two areas will be provided by separate but identical light grids. The diffuser should be a single piece of opal plastic but the stage must be constructed of a single piece of glass. A light baffle, separating the two grids, must be included to prevent light from spilling between the two grid areas. This baffle must be easily removable to prevent unbalanced illumination of the two halves of a positive in monoscopic viewing.

c. The upper, or working, surface of this glass shall protrude above the surrounding area by at least 1/16 of an inch. The metal surface immediately surrounding the viewing stage shall contain holes for the insertion of stage spring clips. These holes will have the same diameter, depth and spacing as is used on the Bausch & Lomb Zoom 70 Trans-illumination Base (part of B&L Catalog Number 53-70-01-01) so that the B&L spring stage clips may be used without modification.

3. Tilting of the Light Table:

a. The light table, with the microscope attached, shall be capable of being tilted about an axis along the front of the light table (see Enclosure 1). The tilting shall permit the operator to place the viewing stage in the horizontal position or up to a maximum angle of 45° to the horizontal. This tilting shall be accomplished in 5° increments of tilt and simple ratchet and pawl, or similar device, will be used to hold the table in the tilted position.

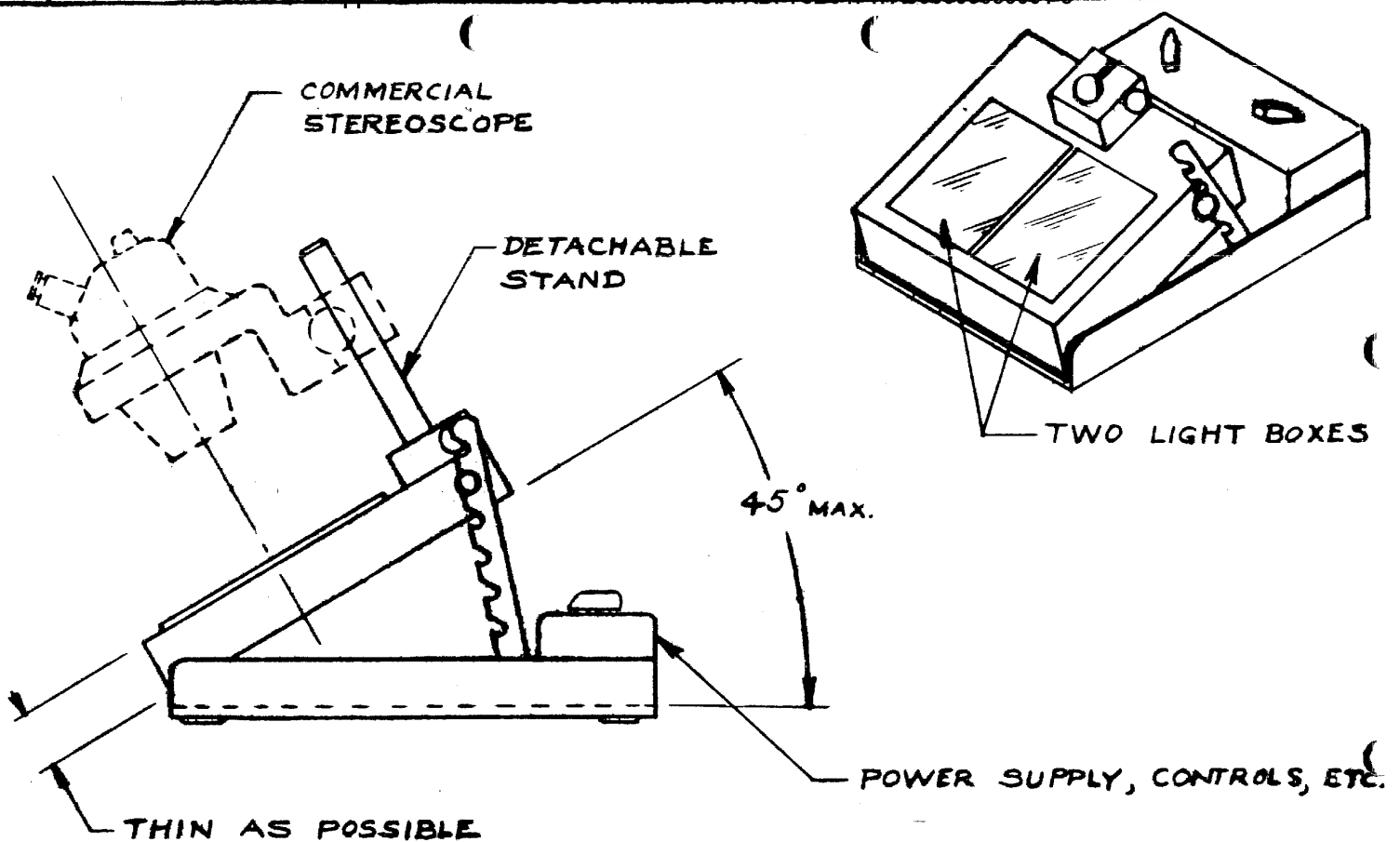
b. The tilting mechanism will be of the positive lock type; that is, either the ratchet or the pawl shall be spring loaded so the table, if jarred, will not fall into the horizontal position.

4. Microscope Mount:

a. In the design and construction of this light table, provisions must be made enabling the user to mount a Bausch & Lomb Model II Zoom 70 Stereoscope, a Wild Model M-5 Stereoscope, or -- by the fabrication of a simple adapter -- to mount any similar type of stereoscope or microscope of approximate weight and size on the light table. Microscope mounts shall be able to be changed by the use of common hand tools or, preferably, by the use of thumb screws.

b. It will be necessary to maintain alignment of the stereoscope's optical axis to within 10 minutes of arc of a right angle to the viewing stage. Provisions must be made for using common hand tools to provide this degree of alignment, regardless of the type of stereoscope or microscope in use.

c. The stereoscope supports must be sufficiently rigid, without "play", to hold and maintain the degree of alignment (10 minutes of arc) stated in paragraph 4b, above. Allowing for the auxiliary lenses of any stereoscope or microscope used, the basic mount must be capable of vertical movement over the viewing area. As an example: the B&L Zoom 70 Stereoscope is used with 0.5X and 2.0X auxiliary lenses for binocular viewing and with a rhomboid for stereo viewing. A gross positioning must be made for approximate focusing with a particular auxiliary lens; then, fine adjustment (normally part of the supporting arm of the stereoscope or microscope) will be used to bring the image into sharp focus.



ENCLOSURE NO. 1

This drawing is included only to convey the basic design of the Twin Light Source Light Table and not as a final design concept.

Summary Sheet: Proposal for a Twin Light Source Stereoscope Light Table

1. Overall dimensions:      height - \_\_\_\_\_ inches  
                                 width - \_\_\_\_\_ inches  
                                 depth - \_\_\_\_\_ inches
  
2. Weight (less stereoscope and support) \_\_\_\_\_ pounds.
  
3. Intensity of light source (measured at the working surface).
  - a. Intensity control at maximum \_\_\_\_\_ foot-lamberts.
  - b. Intensity control at minimum \_\_\_\_\_ foot-lamberts.
  - c. Variation across the grid - maximum \_\_\_\_\_  
   minimum \_\_\_\_\_  
   Percent variation \_\_\_\_\_ =  $\frac{\text{Max-Min}}{\text{Maximum}} \times 100$
  
4. Cost and Delivery Time.

	<u>Cost</u>	<u>Delivery Time*</u>
a. One prototype	_____	_____
b. Three production models	_____	_____
c. One set each of directly reproducible drawings and specifications.	_____	_____

\* After receipt of contract

Enclosure No. 2